

SECTION 1086—SOUND BARRIERS

1086.1 DESCRIPTION—This work is the construction of either structure mounted or ground supported sound barriers.

1086.2 MATERIAL—

(a) Wall Posts.

1. Steel H-beam Posts.

- Fabricated Structural Steel—[Section 1105.02\(a\)2](#)
- Anchor Bolts, Nuts, and Washers—[Section 1105.02\(c\)2](#)
- Epoxy Protection for Structural Steel—[Section 1092.2](#)

2. Precast Reinforced Concrete Posts. [Section 714](#)

- Class AA Cement Concrete—[Section 704](#)
- Reinforcement Bars—[Section 1002](#)
- Deformed Welded Wire Fabric, Epoxy Coated—[Section 709.4](#)

3. Timber Posts. [Sections 1031.2\(a\)](#) and [\(b\)](#)

4. Nonshrink Grout. [Section 1001.2\(e\)](#)

5. Galvanizing. [Section 1105.02\(s\)](#)

6. Caulking Compound. [Section 705.8](#)

(b) Wall Panels.

1. Precast Reinforced Concrete Panels. [Section 714](#)

- Class AA Cement Concrete—[Section 704](#)
- Reinforcement Bars—[Section 1002](#)
- Steel Welded Wire Fabric—[Section 709.3](#)
- Steel Welded Wire Fabric, Epoxy Coated (when indicated)—[Section 709.3\(a\)](#)

2. Timber Panels. [Sections 1031.2\(a\)](#) and [\(b\)](#)

(c) Epoxy Resin Protective Coating. [Section 1019.2\(b\)](#)

(d) Anti-Graffiti Coating. See special provision in the proposal.

(e) Finish. Texture and color of panels and posts to be as indicated and uniform from panel to panel and from post to post.

(f) Foundation.

1. Drilled Caissons. [Section 1006.2](#)

2. Spread Footings.

- Class A Cement Concrete—[Section 704](#)
- Reinforcement Bars, Epoxy Coated—[Section 1002](#)

(g) Unreinforced (Plain) Neoprene Bearing Pads. [Section 1113.02\(a\)](#). Sample the completed pads according to [PTM No. 312](#), except reduce the sampling rate to three pads per structure.

1086.3 CONSTRUCTION—Before fabrication, obtain acceptance of shop drawings. Construct as indicated, as shown on the approved shop drawings, and as follows:

(a) Design. Determine final groundline elevations for ground mounted sound barrier wall. Furnish these elevations to the wall supplier to develop the shop plans including a complete elevation view of each wall section indicating top and bottom elevations and roadway grade. Protect final ground elevations, established in the field, for the duration of the project and do not adjust without prior approval.

Provide fire hydrant openings and other highway access as indicated. Provide adequate reinforcement around panel openings to preclude cracking. Show reinforcement details on the shop drawings.

(b) Shop Drawings. Before beginning construction, submit, for acceptance, shop drawings showing fabrication details; and handling, transportation, and construction procedures for all wall elements including connections.

(c) Installation Requirements.

1. Foundations.

1.a Caisson Foundations. Construct drilled caisson foundations as specified in [Section 1006.3](#), and as follows:

- Provide vertical and tie reinforcement for the full height of the shaft.
- Provide test holes and probe holes only as indicated.

- When permanent casing is used, drill, drive, or vibrate casing so soil is in full contact with the outside of the casing. Alternatively, place casing in an oversized hole and grout the annular space between the permanent casing and the surrounding soil to establish lateral support. Grout after the concrete has obtained its initial set but no later than 24 hours after placement of the concrete. Where excavation is stable and not subject to rapid degradation, the 24 hour period may be extended to 72 hours, as permitted. Use a pressurized grouting method capable of completely filling the open area. Provide grout as specified in [Section 1108.3\(f\)1](#), except testing is not required.
- When temporary casing is used, remove casing as specified in [Section 1006.3\(i\)](#). If unexpected construction conditions require the casing to remain in place, perform grouting as specified for permanent casing to fill cavities surrounding the casing.
- Place caisson concrete within 24 hours of the completion of excavation and within 3 hours of final inspection of the drilled shaft. Where excavation is stable and not subject to rapid degradation, the 24 hour period may be extended to 72 hours, as permitted.

1.b Spread Footings. Construct cement concrete spread footings as indicated. Excavate and backfill foundation area as specified in [Section 204.3](#), and compact using a mechanical tamper.

2. Fabrication. Fabricate concrete posts and panels as specified in [Section 714](#), except, maintain units in secondary curing until they have reached a compressive strength of 70% of the 28-day minimum compressive strength. Fabricate two full-sized samples of each for approval of the acceptable range of color and texture variations, surface blemishes and overall appearance. Fabricate samples using the same process and materials that will be used for all production. Erect approved sample posts/panels at the place of manufacture and store outdoors to allow proper lighting for comparisons during manufacturing and inspection. Architectural treatment for both sample posts/panels and subsequent production will be approved at a viewing distance of 10 m (30 feet). Acceptable samples fabricated according to the approved shop drawings may be incorporated into the project in the final stage of construction, after all production has been completed and approved.

For precast concrete construction, obtain casting approval before construction of any sound barrier wall. Grout all holes in precast concrete posts and panels, resulting from fabrication. Ensure that precast concrete panels and posts are cast in one continuous lift to eliminate cold joints. When precast concrete posts and panels are used, and the panels slip down into the post flanges, fabricate and erect wall sections in a manner that will produce a secure and vibration free installation. Provide a smooth finish on the portions of panels that will be placed in post flanges. Furnish full height panels, or, if allowed, panel sections with tongue and groove or interlocking joints that provide “light tight” conditions at the joints and prevent direct transmission of sound. Furnish top panels finished flush on the top side. Replace cracked or damaged panels and posts. Maintain erected wall in acceptable condition until the project is accepted.

When steel H-beam wall posts are used, furnish posts epoxy-coated as specified in [Section 1092.3](#).

3. Erection. Install sound barrier wall as indicated, as shown on approved shop drawings, and according to the manufacturer's recommendations.

Secure panels to provide a vibration free installation, and provide joints and connections with no visible openings to decrease sound attenuation.

Cut all exposed bars and cables, used in the lifting and erection of precast concrete wall components, flush with the surface. Clean and coat these areas with an approved epoxy as specified in [Section 1019.3\(b\)](#).

Apply anti-graffiti coating to indicated exposed wall surfaces.

Construct finished ground as indicated or directed.

4. Removal of Falsework and Bracing. Keep falsework and bracing that supports posts in place for at least two days after placing the final portion of the foundation.

(d) Tolerances.**1. Fabrication Tolerances.****1.a Reinforced Precast Concrete Posts and Panels—**ACI 117.**1.b Structural Steel Posts—**[ASTM A 6](#)**1.c All Others.****METRIC**

<u>Panels</u>	<u>(mm)</u>	<u>Posts</u>	<u>(mm)</u>
Height:	±6	Length:	±6
Length:	±6	Width:	±6
Thickness:	±6	Depth:	±6
Out of Flatness:		Slot Depth:	±3
-Lengths to 2400 mm:	3	Slot Depth:	±3
-Lengths over 2400 mm:	6	Out of Flatness:	
		-Lengths to 2400 mm:	3
		-Lengths over 2400 mm:	6

ENGLISH

<u>Panels</u>	<u>(inch)</u>	<u>Posts</u>	<u>(inch)</u>
Height:	±1/4	Length:	±1/4
Length:	±1/4	Width:	±1/4
Thickness:	±1/4	Depth:	±1/4
Out of Flatness:		Slot Depth:	±1/8
-Lengths to 8 feet:	1/8	Slot Depth:	±1/8
-Lengths over 8 feet:	1/4	Out of Flatness:	
		-Lengths to 8 feet:	1/8
		-Lengths over 8 feet:	1/4

2. Erection Tolerances.

- Vertical alignment for walls and posts to be 6 mm (1/4 inch) for wall heights to 3100 mm (10 feet), 12 mm (1/2 inch) for wall heights to 6100 mm (20 feet), and 20 mm (3/4 inch) for wall heights greater than 6100 mm (20 feet).
- Horizontal alignment to be as indicated.
- Posts to be set within ±13 mm (±1/2 inch) of the indicated location.

1086.4 MEASUREMENT AND PAYMENT—**(a) Wall Posts.** Each

The price includes foundation, bearing pads, and all associated hardware.

(b) Wall Panels. Square Meter (Square Foot)

Measured to equal the total area of the panel including areas concealed by posts or finished ground.

The unit price includes all associated hardware.

(c) Anti-Graffiti Coating. The Department will pay as specified in the special provision in the proposal.